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Oct 9th, 2019

Outline

A Question from Grade School

(Illustrating beamer's \pause command.)

A couple of years ago, a fifth-grade teacher asked me to explain to her the reasoning behind the “invert and multiply” rule for dividing fractions, e.g.

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$$\frac{4}{5} \div \frac{2}{3} = \frac{4}{5} \times \frac{3}{2}$$

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Let's try to find answers understandable by fifth graders (at least the more patient ones).

Cookie Approach

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If we give 1/3 of a cookie to each person, how many people can we feed with 1 cookie?

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If we give 1/3 of a cookie to each person, how many people can we feed with 1 cookie?
Obviously, the answer is 3.
So we've derived the "invert and multiply" rule in a special case:

$$1 \div \frac{1}{3} = 3$$

Cookie Approach

But what if we give 2/3 of a cookie, not 1/3, to each person?
We're giving 2× as much per person.
So we can feed only 1/2 as many people.
So we feed $\frac{1}{2} \times 3 = \frac{3}{2}$.[1]
So we've derived the "invert and multiply" rule in another case:

$$1 \div \frac{2}{3} = \frac{3}{2}$$

[1] One person gets only a half share.

Cookie Approach

Now, suppose we have only 4/5 of a cookie.
Then we can feed only 4/5 as many people, i.e.

$$\frac{4}{5} \times \frac{3}{2} \text{ people}$$

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Then we can feed only 4/5 as many people, i.e.

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So we've derived the "invert and multiply" rule in the general case:

$$\frac{4}{5} \div \frac{2}{3} = \frac{4}{5} \times \frac{3}{2}$$

Outline

A Geometry Proof

(Illustrating beamer's \uncover command.)

定理

The angles in a triangle sum to 180°.

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定理

The angles in a triangle sum to 180°.

Plan: Extend AC past C to D. Draw CE parallel to AB.

证明.

1. $u = y$

$\square$

证明.

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1. $u = y$ Alternate angles of a transveral.
2. $v = x$ Consecutive interior angles of a transveral

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证明.

1. $u = y$ Alternate angles of a transveral.
2. $v = x$ Consecutive interior angles of a transveral
3. $z+u+v = 180°$

$\square$

证明.

1.	u = y	Alternate angles of a transversal.
2.	v = x	Consecutive interior angles of a transveral
3.	z+u+v = 180°	ACD is a straight line.

□

证明.

1.	u = y	Alternate angles of a transversal.
2.	v = x	Consecutive interior angles of a transversal
3.	z+u+v = 180°	ACD is a straight line.
4.	z+y+x = 180°	

□

证明.

1.	u = y	Alternate angles of a transversal.
2.	v = x	Consecutive interior angles of a transveral
3.	z+u+v = 180°	ACD is a straight line.
4.	z+y+x = 180°	Substitution from Steps 1 and 2.

□

Outline

More Advanced Features of beamer

- This tour just scratches the surface.

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- Advanced example:
  http://latex-beamer.sourceforge.net/beamerexample1.pdf.